AN8081NK

2ch. Switching Power Supply Control

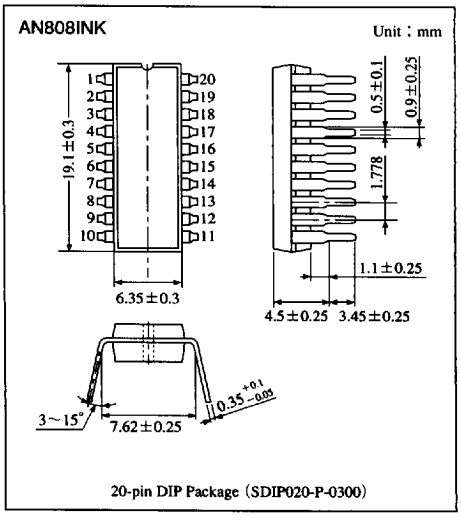
■ Overview

The AN8081NK is an IC which incorporates the basic circuit required for the switching power supply into two channels. It realizes the complete synchronous operation with the same oscillation output waveform.

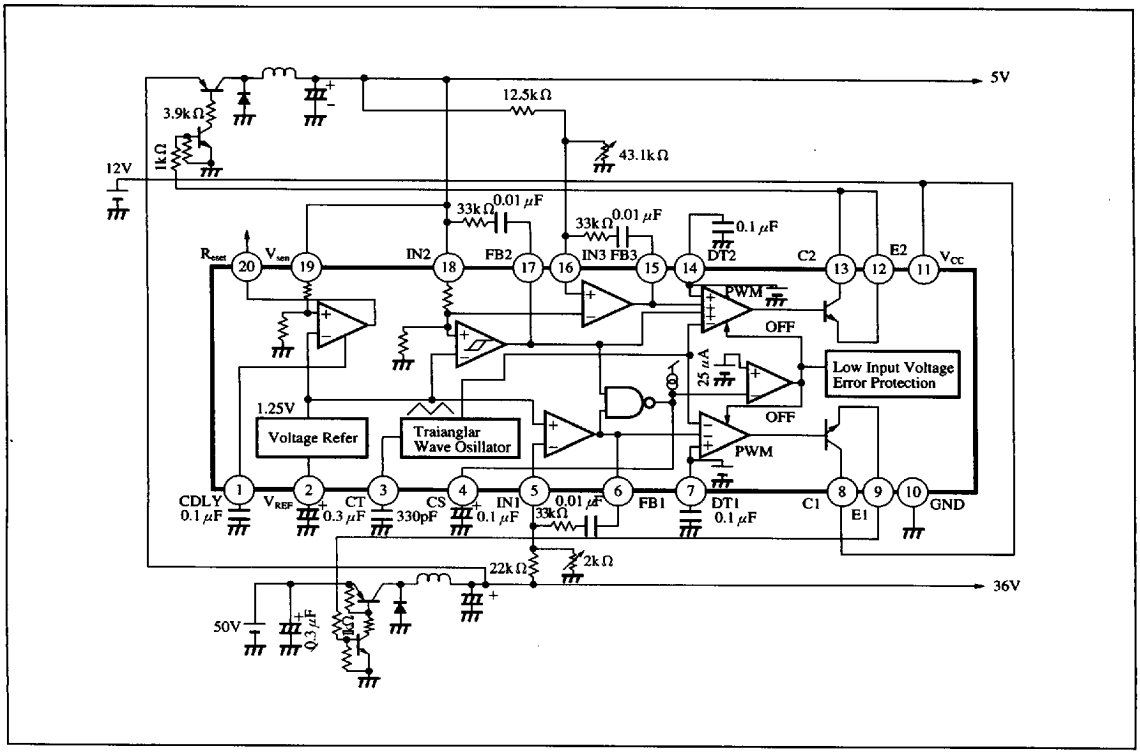
One of two channels uses the output fixed to 5V.

■ Features

- Short-circuit protection function incorporated
- Wide operating supply voltage range (3.6 to 35V)
- Small consumption current (up to 3mA during operation)
- Built-in circuit preventing the malfunction under low input voltage



■ Block Diagram



■ Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	35	V
Power dissipation	P_D		mW
Operating ambient temperature	T_{opr}	−30 to +85	℃
Storage temperature	T_{stg}	−55 to +150	℃

■ Recommended Operating Range (Ta=25℃)

Parameter	Symbol	Range	Unit
Operating supply voltage	V_{CC}	3.6 to 34	V

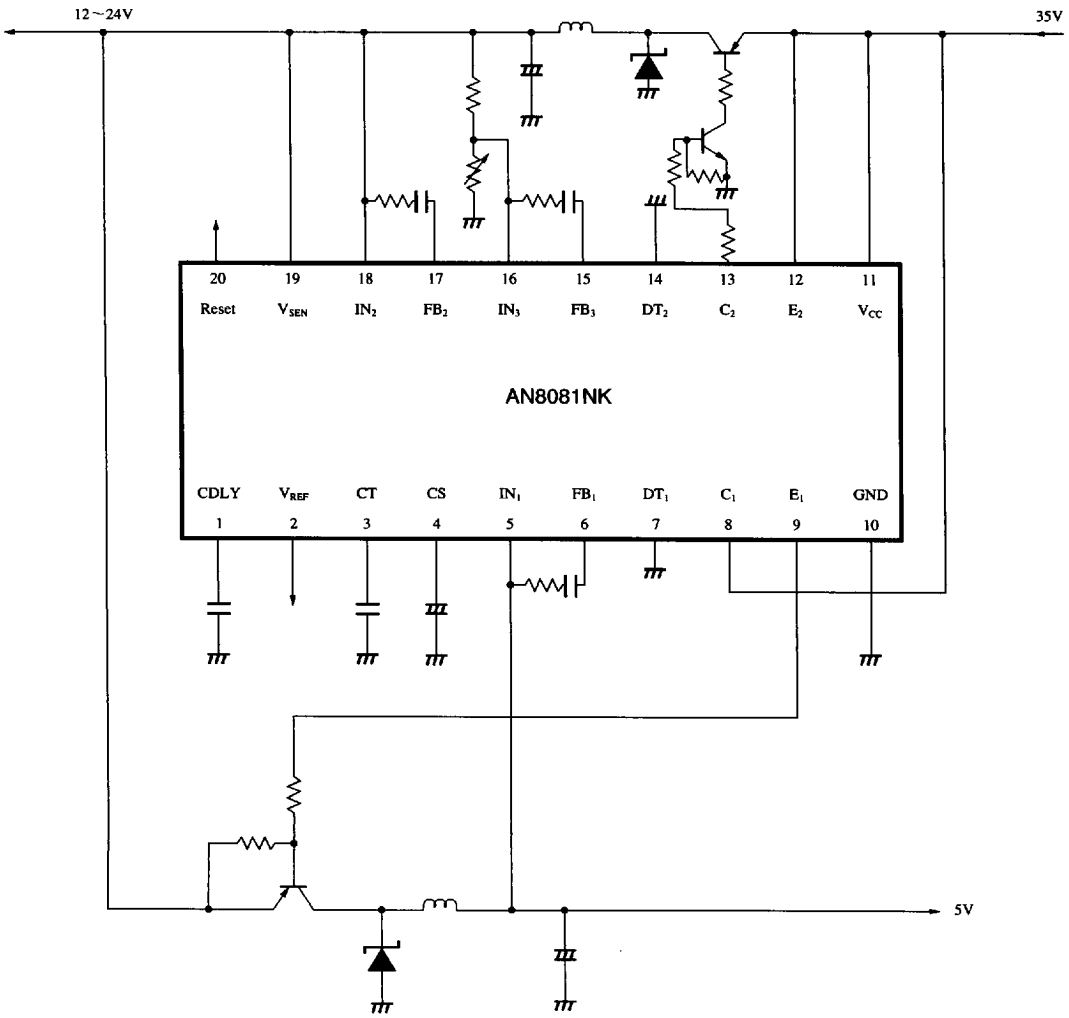
■ Electrical Characteristics (Ta=25℃)

Parameter	Symbol	Condition	min	typ	max	Unit
Supply current	I_{CC}		—	4	7	mA
Reference Voltage Block						
Output voltage	V_{REF}	I_{OR}=−1mA	2.37	2.5	2.62	V
Input stability	Line	V_{CC}=3.6 to 34V	—	10	100	mV
Load stability	L_{OAD}	I_{OR}=0 to −1mA	—	1	100	mV
Circuit Preventing Malfunction Under Low Input						
Threshold voltage	$V_{CC(on)}$		2.8	3	3.2	V
Threshold voltage	$V_{CC(off)}$		2.4	2.6	2.8	V
Hysteresis width	$\Delta V_{CC(th)}$		300	400	500	mV
Short-Circuit Protection Circuit Block						
Input threshold voltage	V_{TH}		1.17	1.27	1.37	V
Charging current	I_{CS}		−35	−25	−15	μA
Triangular Oscillation Block						
Oscillation frequency	f_{OSC}	CT=330pF	90	115	140	kHz
Triangular wave peak value	V_{CTH}	CT=330pF	0.85	0.9	0.95	V
Triangular wave bottom value	V_{CTL}	CT=330pF	0.25	0.3	0.35	V
Dead Time Control Block						
Bias voltage	V_{DT1}		0.82	0.86	0.9	V
Bias voltage	V_{DT2}		0.82	0.86	0.9	V
Error Amp.1						
Input threshold voltage	V_{TH1}		0.72	0.75	0.78	V
Output voltage H	V_{OH1}	V_{IN1}=0V, I_{FB1}=−80μA	2	—	—	V
Output voltage L	V_{OL1}	V_{IN1}=2V, I_{FB1}=500μA	—	—	0.2	V
Error Amp.2						
V_{5IN} threshold voltage	$V_{5IN(TH)}$		4.85	5.05	5.25	V
Input threshold voltage	V_{TH2}		0.72	0.75	0.78	V
Output voltage H	V_{OH2}	V_{5IN}=4.5V, I_{FB2}=−80μA	2.0	—	—	V
Output voltage L	V_{OL2}	V_{5IN}=5.5V, I_{FB2}=500μA	—	—	0.2	V
Error Amp.3						
Input threshold voltage	V_{TH3}	V_{5IN}=5V	0.72	0.75	0.78	V
Output voltage H	V_{OH3}	V_{5IN}=5V, V_{IN3}=0V, I_{FB}=−80μA	2	—	—	V
Output voltage L	V_{OL3}	V_{5IN}=5V, V_{IN3}=2V, I_{FB}=500μA	—	—	0.2	V

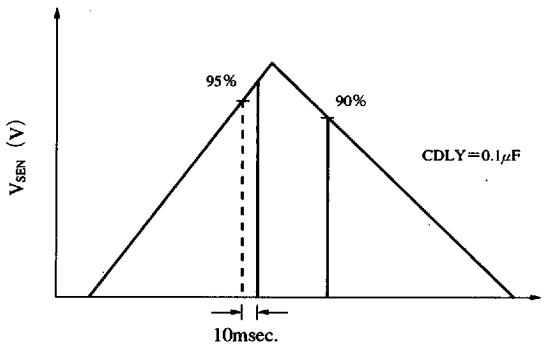
■ Electrical Characteristics (cont.) (Ta=25℃)

Parameter	Symbol	Condition	min	typ	max	Unit
Output Block						
Output voltage	V_{OHC}	V_{IN}=0V, CT=1V, VE=0V, IC=75mA	—	—	0.75	V
Output current	I_{OC}	V_{IN}=0V, CT=0V, VE=0V, VC=35V	—	—	1	μA
Output maximum duty ratio	Γ_{max}	C_T=330pF	85	90	—	%
Reset Output Block						
Threshold voltage	V_{SEN}		4.1	4.3	4.5	V
Hysteresis width	ΔV_{SEN}	V_{SEN}=4V, I_{RESET}=1mA	100	150	200	mV
Output voltage	V_{RESET}	V_{SEN}=4V, V_{5IN}=5V, I_{RESET}=1mA	—	—	0.4	V

■ Application Circuit



■ Timing Chart



■ Pin Descriptions

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	CDLY	Capacitor for reset delay	11	V_{CC}	Power supply
2	V_{REF}	Reference voltage	12	E_2	Emitter output 2
3	CT	Capacitor for oscillation	13	C_2	Collector output 2
4	CS	Short-circuit protection input	14	DT_2	Dead time control 2
5	IN_1	Error amp. input 1	15	FB_3	Error amp. output 3
6	FB_1	Error amp. output 1	16	IN_3	Error amp. input 3
7	DT_1	Dead time control 1	17	FB_2	Error amp. output 2
8	C_1	Collector output 1	18	IN_2	Error amp. input 2
9	E_1	Emitter output 1	19	V_{SEN}	Reset input
10	GND	GND	20	Reset	Reset output